【DESCRIPTION】

【Invention Title】

REINFORCING STRIP FOR SUPPORTING REINFORCED EARTH WALL AND ITS PLACEMENT METHOD

【Technical Field】

The present invention relates to a reinforcing strip for supporting a reinforced earth wall and a method for placing the same, and more particularly to a reinforcing strip for supporting a reinforced earth wall, the front end of which is folded into halves and is directly inserted into a reinforcing strip insertion groove formed in an earth wall block so that the reinforcing strip is firmly and simply connected to the block without using sub-materials, such as anchors or anchor pins, and is not sagged to prevent the concentration of stress thereon so that defects in placement of the reinforcing strip are not generated, the portion, buried under the reinforced earth wall, of which is not folded and is spread to exert frictional support force upon the reinforced earth wall, and the rear end of which exerts passive support resisting force, and a method for placing the same.

【Background Art】

FIG. 10 is a perspective view illustrating the constructed state of a conventional reinforced earth wall using earth wall construction blocks and reinforcing strips. The reinforced earth wall is constructed such that front ends (F) of reinforcing strips 2 for supporting blocks 1 forming the front surface of the earth wall are connected to the blocks 1 by anchors 3 and anchor pins 4,

and other portions of the reinforcing strips 2 are spread and buried under a reinforced earth 5.

In the above conventional reinforced earth wall using the reinforcing strips 2, since the anchors 3 and the anchor pins 4 for connecting the reinforcing strips 2 and the blocks 1 must be installed at respective connection portions between the reinforcing strips 2 and the blocks 1, the numbers of the anchors 3 and the anchor pins 4 are at least several times the number of the blocks 1, thereby increasing costs of sub-materials. Further, in a processing for connecting the reinforcing strips 2 and the blocks 1, since the front ends (F) of the reinforcing strips 2 surrounds the anchor pins 4, rear ends (R) of the reinforcing strips 2 must be fixed to temporary fixing steel rods 6 by fixing piles 7 so that the reinforcing strips 2 are tightened such that folded portions of the reinforcing strips 2 have a small radius of curvature so as not to be sagged, thereby causing a problem in requiring additional sub-materials. The above sub-materials are buried in the reinforced earth 5 when the earth wall is constructed, and cannot be reused, thus squandering resources and increasing construction costs. Further, the tightening process of the reinforcing strips 2 requires many persons simultaneously and is tough, and the process for temporary fixing the reinforcing strips 2 to the reinforced earth 5 under the condition that the reinforcing strips 2 are tightened is inefficient, thus deteriorating the constructing efficiency of the reinforced earth wall.

Since the conventional reinforcing strip has a connection portion with a block having a rigid structure against vertical movement, the surface of the structure, i.e., the surface of the earth wall consisting of the blocks, is greatly displaced due to the subsidence of the reinforced earth after construction. Further, since the front end (F) of the reinforcing strip is folded so that

the front end (F) has a small radius of curvature, stress is concentrated on the folded front end (F) of the reinforcing strip after the construction. Moreover, since connection materials having different shapes or dimensions are used according to the sizes and the shapes of the connection portions between the blocks and the reinforcing strips, the construction costs are increased due to the addition of sub-materials and the efficiency in constructing the reinforcing earth wall is deteriorated. When the connection materials are used, efforts to assure safety of the connection structures between the blocks and the reinforcing strips must be made.

Since the conventional reinforcing strips have a width larger than the size of the blocks, the construction density of the reinforcing strips is low compared to the size and number of the blocks forming the reinforced earth wall. Thereby, the constructed reinforced earth wall has an unstable structure.

In order to solve the above problems, the present applicant has developed various apparatuses for tightening a reinforcing strip using the principle of a wire grip and methods for tightening a reinforcing strip using the same so that a person can easily and efficiently tighten the above reinforcing strip, and obtained Korean Patent Nos. 302139 and 404128, and Korean Utility Model Registration Nos. 216353, 21457, 221903, 223133, and 314862. The above apparatuses and methods are substantially applied to construction sites.

Using the above apparatuses and methods, the process for tightening the reinforcing strip of the conventional reinforced earth wall is more easily and rapidly performed. However, sub-materials, such as the anchors, the anchor pins, and the temporary fixing steel rods, for connecting the reinforcing strips to the blocks and maintaining the tightened states of the reinforcing

strips before the reinforcing strips are buried under the reinforcing earth are still required, thus causing the same problems. Those skilled in the art, such as the present applicant and persons related to the construction of the reinforced earth walls, have made a study of the resolution of the above problems, but any measurement has not been yet proposed.

【Disclosure】

【Technical Problem】

Therefore, the present invention has been made in view of the above problems, and it is an object of the present invention to provide a reinforcing strip, for supporting a reinforced earth wall, which is directly connected to an earth wall construction block without an anchor and an anchor pin so that a plurality of the reinforcing strips are continuously placed on a reinforced earth in a zigzag shape or are individually placed on the reinforced earth to firmly support the blocks, and has construction density corresponding to the size and number of the blocks, and a method for placing the same.

【Technical Solution】

In accordance with an aspect of the present invention, the above and other objects can be accomplished by the provision of a method for placing reinforcing strips for supporting a reinforced earth wall, in which front ends of the reinforcing strips are inserted into reinforcing strip insertion grooves of blocks forming the surface of the reinforced earth wall under the condition that the front ends of the reinforcing strips are folded into halves in the lengthwise direction so as to have a half width.

Rear ends of the reinforcing strips installed in a reinforced earth in a zigzag shape are folded in the width direction, and the folded rear ends of the reinforcing strips are buried under the reinforced earth wall under the condition that the rear ends are fixed to the reinforced earth by temporary fixing nails or fixed to resistors made of concrete blocks by fixing pins, are buried under the reinforced earth wall or inserted into the resistors by the fixing pins under the condition that the rear ends are folded into halves and erected in the lengthwise direction.

In accordance with another aspect of the present invention, there is provided a reinforcing strip, for supporting a reinforced earth wall, comprising a plurality of polyester fabric bundles arranged in parallel and coated with polyethylene resin, wherein a folding groove is formed in a central portion of the reinforcing strip in the lengthwise direction so that the central portion of the reinforcing strip has a smaller thickness than other portions of the reinforcing strip.

Preferably, the folding groove is formed in upper and lower surfaces of the reinforcing strip, and facilitates the upward or downward folding of the reinforcing strip in the lengthwise direction.

More preferably, protrusions for displaying the length of the reinforcing strip are rectilinearly formed in the lengthwise direction of the reinforcing strip such that the protrusions are separated from each other by a designated interval of 50cm or 1m. The protrusions serve to estimate the length of the reinforcing strip without using a ruler, thereby facilitating the cutting or folding of the reinforcing strip to a designated length.

【Advantageous Effects】

The present invention provides a reinforcing strip, for supporting a reinforced earth wall, which is directly connected to an earth wall construction block without an anchor or an anchor pin to facilitate the connection between the reinforcing strip and the block without additional sub-material costs, the front end of which is folded into halves and is directly inserted into a reinforcing strip insertion groove formed in the block to prevent the sagging of the reinforcing strip, and the rear end of which is folded into halves or erected and serves as a resistor or uses a separate resistor so that the rear end of the reinforcing strip is easily fixed to a reinforced earth wall by a temporary fixing nail, is used in a reinforced earth having a narrow area, or exerts more firm supporting force, and a method for placing the same, thereby improving the constructing efficiency and reducing material costs and labor costs, thus being capable of economically constructing a reinforced earth wall.

【Description of Drawings】

The above and other objects, features and other advantages of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 illustrates perspective and partially enlarged views of a reinforcing strip in accordance with the present invention;

FIG. 2 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a first embodiment of the present invention;

FIG. 3 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a second embodiment

of the present invention;

FIG. 4 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a third embodiment of the present invention;

FIG. 5 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a fourth embodiment of the present invention;

FIG. 6 is an enlarged perspective view of a portion of the reinforcing strip connected to a block in the method of the present invention;

FIG. 7 is a plan view illustrating a method for placing a reinforcing strip in accordance with a fifth embodiment of the present invention;

FIG. 8 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a sixth embodiment of the present invention;

FIG. 9 is a perspective view illustrating a method for placing a reinforcing strip in accordance with a seventh embodiment of the present invention; and

FIG. 10 is a perspective view illustrating the placement of a conventional reinforcing strip.

【Best Mode】

Now, preferred embodiments of the present invention will be described in detail with reference to the annexed drawings.

FIG. 1 illustrates perspective and partially enlarged views of a reinforcing strip in accordance with the present invention. The reinforcing strip 10 of the present invention comprises a plurality of polyester fabric bundles 12 arranged in parallel, and a polyethylene clothing layer 14 covering the outer surfaces of

the polyester fabric bundles 12. A folding groove 16 is formed in the central portion of the reinforcing strip 10 in the lengthwise direction of the reinforcing strip 10 such that the folding groove 16 has a smaller thickness than other portions of the reinforcing strip, and protrusions 18 for displaying the length of the reinforcing strip, which are rectilinearly arranged in the lengthwise direction of the reinforcing strip 10 and are separated from each other by a designated interval of 50cm or 1m, are formed in the widthwise direction of the reinforcing strip 10.

The reinforcing strip 10 of the present invention, as shown in FIG. 1, is structured such that the polyester fabric bundles 12 having the same number are arranged on both sides, i.e., left and right sides, of the reinforcing strip 10 centering on the folding groove 16. Accordingly, when the reinforcing strip 10 is folded at the folding groove 16, both halves of the reinforcing strip 10, i.e., left and right halves of the reinforcing strip 10, are overlapped. The reason is that the reinforcing strip 10 is directly inserted into a reinforcing strip insertion groove 22 of an earth wall construction block 20. Since the overall width and thickness of the reinforcing strip 10 are related to the size of the reinforcing strip insertion groove 22 of the earth wall construction block 20, the earth wall construction block 20 and the reinforcing strip 10 must be designed in consideration of the above relation.

Although FIG. 1 illustrates the structure of the reinforcing strip 10, in which two polyester fabric bundles 12 are arranged at both sides of the folding groove 16, the structure of the reinforcing strip 10 is not limited thereto. That is, the number of the polyester fabric bundles 12, which are arranged at both sides of the folding groove 16, may be increased or decreased.

In the present invention, the folding groove 16 is formed in upper and lower surfaces of the reinforcing strips 10 so as to facilitate the upward and downward folding of the reinforcing strip 10 into halves in the lengthwise direction, thereby increasing workability in a site regardless of the folding direction.

The protrusions 18 for displaying the length of the reinforcing strip 10 are rectilinearly arranged in the lengthwise direction of the reinforcing strip 10 and are separated from each other by a designated interval of 50cm or 1m in the widthwise direction of the reinforcing strip 10, so that the protrusions 18 are seen with the naked eye. The protrusions 18 serve to allow a worker in a placement site of the reinforcing strip 10 to rapidly and precisely estimate the length of the reinforcing strip 10 without measuring the length of the reinforcing strip 10, thereby allowing the worker to cut or fold the reinforcing strip 10 to a designated length.

Hereinafter, various methods for constructing the above reinforcing strip of the present invention to support a reinforced earth wall will be described in detail.

FIGS. 2 to 5 respectively illustrate methods for constructing reinforcing strips in accordance with various embodiments of the present invention. In the embodiment shown in FIG. 2, the front ends (F) of the reinforcing strips 10 are inserted into the reinforcing strip insertion grooves 22 of the blocks 10 forming the surface of the reinforced earth wall under the condition that the front ends (F) of the reinforcing strips 10 are folded into halves, so that the reinforcing strips 10 placed on a reinforced earth 50 are arranged in a zigzag shape. The front ends (F) of the reinforcing strips 10 are sequentially and continuously inserted into the reinforcing strip insertion grooves

22 of the blocks 20.

In this embodiment, the rear ends (R) of the reinforcing strips 10 are fixed to the reinforced earth 50 by temporary fixing nails 30 such that the rear ends (R) of the reinforcing strip 10 are folded into halves in the lengthwise direction and the folded states of the rear ends (R) are maintained, and are coated again with the reinforcing earth 50, and then the reinforcing earth 50 coating the rear ends (R) is hardened.

FIG. 6 is an enlarged perspective view of a portion of the reinforcing strip connected to the block in the method of the present invention. Reference numeral 60 represents a U-shaped protector made of synthetic resin and used to insert the front end (F) of the reinforcing strip 10 folded into halves into the reinforcing strip insertion groove 22 of the block 20. The protector 60 serves to cause the front end (F) of the reinforcing strip, folded into halves, to be inserted into an insertion groove 62 formed therein so as to uniformly maintain the folded state of the reinforcing strip 10, and to maximally prevent the front end (F) of the reinforcing strip 10 from rubbing with the rough surface of the block 20 made of concrete, thereby decreasing the damage to the reinforcing strip 10.

The protector may be used or the use of the protector may be omitted, as occasion in a construction site demands.

Since the front ends (F) of the reinforcing strips 10 are inserted into the reinforcing strip insertion grooves 22 of the blocks 20, the reinforcing strips 10 and the blocks 20 are directly connected without separate anchors or anchor pins. Further, vertical connection pins 70 for connecting upper and lower blocks 10 are installed in the reinforcing strip insertion grooves 22, thereby causing the reinforcing strips 10 to more firmly support the blocks 20.

FIG. 3 illustrates a method for placing a reinforcing strip in accordance with a second embodiment of the present invention. Front ends (F) and middle portions of the reinforcing strips 10 of this embodiment have the same structures as those of the earlier embodiment as shown in FIG. 2. However, in the reinforcing strip 10 of this embodiment, rear ends (R) of the reinforcing strip 10 are laid down under the condition that the rear ends of the reinforcing strips 10 are folded in the widthwise direction so as to be overlapped, are fixed to the reinforced earth 50 by temporary fixing nails 5, and are then buried under another layer of the reinforced earth 50.

FIG. 4 illustrates a method for placing a reinforcing strip in accordance with a third embodiment of the present invention. Front ends (F) and middle portions of the reinforcing strips 10 of this embodiment have the same structures as those of the earlier embodiment as shown in FIG. 2. However, in the reinforcing strip 10 of this embodiment, rear ends (R) of the reinforcing strip 10 are inserted into resistors 40 made of concrete under the condition that the rear ends (R) of the reinforcing strip 10 are folded in the widthwise direction, and are connected to the resistors 40 by fixing pins 42.

FIG. 5 illustrates a method for placing a reinforcing strip in accordance with a fourth embodiment of the present invention. The reinforcing strip of this embodiment has a structure similar to that of the earlier embodiment as shown in FIG. 3. However, in the reinforcing strip 10 of this embodiment, rear ends (R) of the reinforcing strip 10 are inserted into resistors 40 under the condition that the rear ends (R) of the reinforcing strip 10 are folded into halves in the lengthwise direction, and are connected to the resistors 40 by fixing pins 42.

The methods as shown in FIGS. 4 and 5 are applied to a

construction site requiring a reinforcing strip, on which passive resistance as well as frictional resistance is exerted, by connecting the resistors 40 to the rear ends (R) of the reinforcing strip 10.

Although the methods in accordance with the embodiments as shown in FIGS. 2 to 5 illustrate the reinforcing strips 10 continuously placed on the reinforced earth 50 in a zigzag shape, the present invention is not limited to the above shape of the reinforcing strips 10. That is, as shown in FIG. 7, the reinforcing strips 10 are cut to a designated length, and the front ends (F) of the obtained cut reinforcing strips 10 are folded into halves in the lengthwise direction and inserted into the reinforcing strip insertion grooves 22 of the blocks 20, and the rear ends (R) of the cut reinforcing strips 10 are spread, and are buried under the reinforced earth 50.

FIGS. 8 and 9 illustrate methods for constructing reinforcing strips in accordance with sixth and seventh embodiments of the present invention.

The methods shown in FIGS. 8 and 9 are the same as the methods in accordance with the first to fifth embodiments in that the front ends (F) of the reinforcing strip 10 are folded into halves in the lengthwise direction and connected to the reinforcing strip insertion grooves 22 of the blocks 22, but differs from the methods in accordance with the first to fifth embodiments in that the front ends (F) of the reinforcing strips 10 are simultaneously inserted into the reinforcing strip insertion grooves 22 formed in the neighboring blocks 20 (in FIG. 8) or inserted into the reinforcing strip insertion grooves 22 formed in left and right sides of one block 20 (in FIG. 9).

In the methods as shown in FIGS. 8 and 9, since the rear ends (R) of the reinforcing strips 10 are buried under the

reinforced earth 50 under the condition that the rear ends (R) of the reinforcing strips 10 are folded into halves in the lengthwise direction, passive support resisting force is exerted on the reinforcing strips 10 in addition to the frictional force exerted on the middle portions of the reinforcing strips 10. If necessary, the reinforcing strips 10 may be buried under the reinforced earth 50 under the condition that the rear ends (R) of the reinforcing strips 10 are not folded into halves, are spread, and are vertically erected.

The method for placing a reinforcing strip of the present invention is not limited to the above first to seventh embodiments. That is, the shape or size of portions of the reinforcing strip connected to the block forming the earth wall may be modified according to various shapes of the block. The connection of the reinforcing strips to the blocks does not employ separate sub-materials, but is simply completed by inserting the front ends of the reinforcing strips to the reinforcing strip insertion grooves of the blocks under the condition that the front ends of the reinforcing strips are folded into halves in the lengthwise direction. Since the portions of the reinforcing strips connected to the blocks are firmly connected to the reinforcing strip insertion grooves of the blocks, the connection portions (folding portions) of the reinforcing strips are not easily separated from the blocks during construction. Further, the concentration of stress onto the connection portions and the sagging of the reinforcing strips, which was generated when the conventional reinforcing strips were connected to the blocks using metal anchors and metal anchor pines, are not generated, thus preventing the irregular protrusion of the earth wall. Boundary portions between the folded portions of the reinforcing strips, inserted into the reinforcing strip insertion grooves of the

blocks, and the spread portions of the reinforcing strips buried under the earth wall serve as buffer zones for preventing concentration of stress generated due to the spreading of the folding portions or the folding of the spread portions when the reinforced earth subsides and preventing breakage of the blocks due to the concentrated vertical load applied to the blocks due to the subsidence of the reinforced earth.

When the rear ends of the reinforcing strips are buried under the reinforced earth under the condition that the rear ends of the reinforcing strips are folded into halves in the lengthwise direction without using separate materials or not folded and erected, passive resisting force is exerted on the rear ends of the reinforcing strips in addition to fractional force of the reinforcing strips, thereby facilitating a more firm and stable construction of the reinforced earth wall.

The reinforcing strip of the present invention has a width half the width of the conventional strips, thus being easily carried and handled in a construction site. Further, since the width of the reinforcing strip is proper to the size of the block, the reinforcing strip is designed such that the construction density of the reinforcing strip is optimum. Accordingly, it is possible to construct a reinforced earth wall having a stable structure using the minimum of materials.

【Industrial Applicability】

As apparent from the above description, the present invention provides a reinforcing strip, for supporting a reinforced earth wall, which is directly connected to an earth wall construction block without an anchor or an anchor pin to facilitate the connection between the reinforcing strip and the

block without additional sub-material costs, the front end of which is folded into halves and is directly inserted into a reinforcing strip insertion groove formed in the block to prevent the sagging of the reinforcing strip, and the rear end of which is folded into halves or erected and serves as a resistor or uses a separate resistor so that the rear end of the reinforcing strip is easily fixed to a reinforced earth wall by a temporary fixing nail, is used in a reinforced earth having a narrow area, or exerts more firm supporting force, and a method for placing the same, thereby improving the constructing efficiency and reducing material costs and labor costs, thus being capable of economically constructing a reinforced earth wall.

Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.